UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,845	12/21/2004	Marie Jacob	FR 020067	1286

24737 7590 02/03/2010
PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER	
PARK, EDWARD	

ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
02/03/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/518,845
Filing Date: December 21, 2004
Appellant(s): JACOB ET AL.

Katharyn E. Owen
(Reg. #: 62,849)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 11/16/09 appealing from the Office action mailed 6/16/09.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,295,464b1	Metaxas	9-2001
5,803,914	Ryals et al	9-1998

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 101

1. In response to applicant's amendment of claim 11, the amendment does not overcome the previous 101 rejection. The examiner notes that the current amendment does not recite a method process that is tied to a particular machine. This explanation is elaborated in the 101 rejection below.

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 11, 12, 14, 15 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. The Federal Circuit[1], relying upon Supreme Court precedent[2], has indicated that a statutory "process" under 35 U.S.C. 101 must (1) be tied to a particular machine or apparatus, or (2) transform a particular article to a different state or thing.

---

[1] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

[2] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

This is referred to as the "machine or transformation test", whereby the recitation of a particular machine or transformation of an article must impose meaningful limits on the claim's scope to impart patent-eligibility (See *Benson*, 409 U.S. at 71-72), and the involvement of the machine or transformation in the claimed process must not merely be insignificant extra-solution activity (See *Flook*, 437 U.S. at 590"). While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform an article nor are positively tied to a particular machine that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. That is, the method includes steps of acquiring, , etc. is of sufficient breadth that it would be reasonably interpreted as a series of steps completely performed mentally, verbally, or without a machine. The cited claims do not positively recite any structure within the body of the claim which ties the claim to a statutory category. Furthermore, the examiner suggests that the structure needs to tie in the basic inventive concept of the application to a statutory category. Structure that ties insignificant pre or post solution activity to a statutory category is not sufficient in overcoming the 101 issue. Additionally, the limitations do not claim data that represents a physical object or substance, the data representing the physical object is not present and therefore can not be modified by the process in a meaningful or significant manner, and no meaningful and significant external, non-data depiction of a physical object or substance is produced. Thus, the limitations do not satisfy the transformation test.

[1] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

[2] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claims 16, 19** are rejected under 35 U.S.C. 102(b) as being anticipated by Metaxas (US 6,295,464 B1).

Regarding **claim 16**, Metaxas discloses a computer-readable storage medium, comprising computer executable instructions (see fig. 15) for processing ultrasound image data and for displaying an ultrasound image of a deformable 3D organ with indications of the organ wall motions, the computer executable instructions causing an image processing device to:
acquire image data of an image sequence of the organ under study (see fig. 15, numeral 403, fig. 1a-e, col. 15, lines 45-62, col. 6, lines 66-67, col. 7, lines 1-18; material points 401 on the surface of and within object 402 are detected by sensor 403, sensor 403 generates a plurality of signals 404 that correspond to respective material points 401; if tissue imaging is continued after the saturation pulse sequence is applied, those dark lines can e seen to move, thereby allowing the tracking of the underlying tissue motion);

segment the 3D organ in the images of the sequence for locating the 3D object wall (see fig. 4, col. 9, lines 44-61, col. 4, lines 40-60; model can be tessellated so that each volume element 201-203 has its triangular faces 204, 205 at the LV's inner and outer walls 206, 207, respectively); define regions of interest on the segmented 3D organ wall (see fig. 6, col. 9, lines 61-67, col. 10, lines 1-5, forces from each boundary data point P, 220, to the corresponding model wall (inner or outer) can be computed by approximating each boundary triangular element with a plane 223); and

process the image data to determine the amplitude of displacement of each of said regions of interest as a function of time (see fig. 9a-c, col. 12, lines 45-62; typical motion of an LV model observed at two subsequent time instances, T and T+1, model frames 300, 301, respectively, which shows that the motion at the apex of the LV is relatively small, relatively uniform longitudinal contraction from apex to base can be captured).

Regarding **claim 19**, Metaxas discloses construct a second 2D simplified representation of the 3D segmented organ wall, similar to the first 2D simplified representation of the 3D segmented organ wall, this second 2D simplified representation being called 2D simplified phase representation time (see fig. 9a-c, col. 12, lines 28-67, col. 13, lines 1-18; long-axis views generally coincide with yz-plane 261, the parameter function a3 can capture the longitudinal contraction motion, global translation in the x and the y directions 275, 274, respectively, of the model 2262 frame can be negligible, fig. 9a, a typical motion of an LV model observed at T and T+1, a relatively uniform longitudinal contraction from apex to base can be captured).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 1-11, 14, 17, 18, 20, 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Metaxas (US 6,295,464 B1) in view of Ryals et al (US 5,803,914).

Regarding **claim 1, 2**, Metaxas discloses an image processing system for displaying information relating to the amplitude of displacements of wall regions of a deformable 3D object under study, the system comprising:

acquisition means for acquiring image data of an image sequence of the 3D object under study (see fig. 15, numeral 403, fig. 1a-e, col. 15, lines 45-62, col. 6, lines 66-67, col. 7, lines 1-18; material points 401 on the surface of and within object 402 are detected by sensor 403, sensor 403 generates a plurality of signals 404 that correspond to respective material points 401; if tissue imaging is continued after the saturation pulse sequence is applied, those dark lines can e seen to move, thereby allowing the tracking of the underlying tissue motion);

processing means for:

processing the 3D object data in the images of the sequence for locating the 3D object wall (see fig. 4, col. 9, lines 44-61, col. 4, lines 40-60; model can be tessellated so that each volume element 201-203 has its triangular faces 204, 205 at the LV's inner and outer walls 206, 207, respectively),

defining regions of interest on the object wall (see fig. 6, col. 9, lines 61-67, col. 10, lines 1-5, forces from each boundary data point P, 220, to the corresponding model wall (inner or outer) can be computed by approximating each boundary triangular element with a plane 223), and processing the image data of the 3D object wall to determine the amplitude of displacement of each of said regions of interest as a function of time (see fig. 9a-c, col. 12, lines 45-62; typical motion of an LV model observed at two subsequent time instances, T and T+1, model frames 300, 301, respectively, which shows that the motion at the apex of the LV is relatively small, relatively uniform longitudinal contraction from apex to base can be captured); and constructing a first 2D simplified representation of the 3D object wall by projection of the 3D object wall along an axis, comprising the projections of the regions of interest in said 2D simplified representation, indications of the maximal or minimal amplitudes of displacements of the regions of interest over a period of time (see fig. 9a-c, col. 12, lines 28-67, col. 13, lines 1-18; long-axis views generally coincide with yz-plane 261, the parameter function a3 can capture the longitudinal contraction motion, global translation in the x and the y directions 275, 274, respectively, of the model 2262 frame can be negligible, fig. 9a, a typical motion of an LV model observed at T and T+1, a relatively uniform longitudinal contraction from apex to base can be captured).

Metaxas does not disclose displaying indications of the amplitudes of displacement of each of the regions of interest of the 3D object wall in the respective projections of said regions of interest, called segments, in said constructed 2D simplified representation.

Ryals teaches comprising display means for displaying indications of the amplitudes of displacement of each of the regions of interest of the 3D object wall in the respective projections

of said regions of interest, called segments, in said constructed 2D simplified representation (see figure 15, numeral 1528, col. 48, lines 23-46).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Metaxas to display indications of amplitudes of displacement as suggested by Ryals, in order to provide an effective display system allowing efficient location, display and comparison of image frames of the multitude of image frames (see col. 5, lines 1-11).

Regarding **claims 3, 4**, Metaxas, with Ryals combination discloses all elements as mentioned above in claim 2. Metaxas with Ryals combination further discloses displaying indication of the instants of time at which the maximum or minimum of amplitudes of displacements occur in the regions of interest, over said period of time, in said 2D simplified phase representation (see Metaxas: figure 9a-9c; col. 12, lines 45-63). Metaxas, with Ryals combination as applied to claim 2 does not disclose constructing a second 2D simplified representation of the 3D object wall called 2D simplified phase representation; displaying 2D simplified phase representation; and means to display the 2D simplified amplitude representation and the 2D simplified phase representation together in a same image.

Ryals teaches constructing a second 2D simplified representation of the 3D object wall called 2D simplified phase representation; displaying 2D simplified phase representation (col. 5, lines 50-67; means for displaying a first image during diastolic phase of a cardiac cycle and systolic phase); and means to display the 2D simplified amplitude representation and the 2D simplified phase representation together in a same image (figure 13; col. 38, lines 27-48).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Metaxas with Ryals combination as applied to claim 2 to utilize a phase

representation and display it simultaneously with the amplitude representation as suggested by Ryals, in order to provide an effective display system allowing efficient location, display and comparison of image frames of the multitude of image frames (see col. 5, lines 1-11).

Regarding **claim 5**, Metaxas, with Ryals combination discloses all elements as mentioned above in claim 4. Metaxas, with Ryals combination as applied to claim 4 does not teach display the values of amplitude and of time in the respective 2D simplified amplitude representation in a color-coded manner.

Ryals teaches display the values of amplitude (figure 13, numeral 1370) and of time (figure 3, numeral 365) in the respective 2D simplified amplitude representation in a color-coded manner (figure 15, numeral 1528).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Metaxas with Ryals combination as applied to claim 4 to display indications of amplitudes of displacement in a color-coded manner as suggested by Ryals, in order to provide an effective display system allowing efficient location, display and comparison of image frames of the multitude of image frames (see col. 5, lines 1-11).

Regarding **claim 6**, Metaxas with Ryals combination discloses all elements as mentioned above in claim 1. Metaxas with Ryals combination as applied to claim 1 does not disclose means to display indications of the amplitudes of displacement of the regions of interest of the 3D object wall in the respective projections of the regions of interest, called segments, in said constructed 2D simplified representation, in a color-coded manner, the indications of the amplitudes of displacement changing in the segments at the rate of the images of the sequence, so as to form an animated 2D simplified representation as a function of time.

Ryals teaches means to display (figure 2, numeral 105) indications of the amplitudes of displacement of the regions of interest of the 3D object wall in the respective projections of the regions of interest, called segments, in said constructed 2D simplified representation, in a color-coded manner, the indications of the amplitudes of displacement changing in the segments at the rate of the images of the sequence, so as to form an animated 2D simplified representation as a function of time (figure 13; col. 39, lines 39-67; col. 40, lines 1-67).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Metaxas with Ryals combination as applied to claim 1 to display indications of amplitudes of displacement in a color-coded manner as suggested by Ryals, in order to provide an effective display system allowing efficient location, display and comparison of image frames of the multitude of image frames (see col. 5, lines 1-11).

Regarding **claim 7**, Metaxas with Ryals combination discloses all elements as mentioned above in claim 1. Metaxas with Ryals combination as applied to claim 1 does not disclose means to display the 2D simplified representation of the 3-D object wall as 2D bull's eye representations.

Ryals, in the same field of endeavor, teaches means to display the 2D simplified representation of the 3-D object wall as 2D bull's eye representations (see fig. 14, col. 44, lines 55-67, col. 45, lines 1-67).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Metaxas with Ryals combination as applied to claim 1 to utilize a bull's eye representation as suggested by Ryals, in order to enhance "diagnosing cardiac disease and

detecting ischemic areas that would otherwise be falsely identified as an infarct" (see col. 45, lines 38-56).

Regarding **claim 8**, Metaxas discloses a heart left ventricle and the regions of interest include the internal boundary of the left ventricle wall (see figures 9a-9c).

Regarding **claim 9**, Metaxas discloses segmentation means for operating a segmentation technique applied to the 3D object under study, which includes using a mesh model technique, and reshaping the mesh model for mapping said mesh model onto the wall of the 3D object under study, so as to provide a simplified volume with a wall, called object wall, that is the object of interest (see col. 7, lines 45-56).

Regarding **claim 10**, Metaxas discloses a suitably programmed computer (see fig. 15, numeral 400) or a special purpose process having circuit means, which are arranged to process image data as claimed in claim 1, and having means to display the processed images (see fig. 15, numerals 410, 411).

Regarding **claim 11**, Metaxas discloses an image processing method for processing ultrasound image data and for displaying an ultrasound image of a deformable 3-D organ with indication of the organ wall motions, wherein the method is performed by an image processing system, comprising steps of:

acquiring image data of an image sequence of the organ under study (see fig. 15, numeral 403, fig. 1a-e, col. 15, lines 45-62, col. 6, lines 66-67, col. 7, lines 1-18; material points 401 on the surface of and within object 402 are detected by sensor 403, sensor 403 generates a plurality of signals 404 that correspond to respective material points 401; if tissue imaging is continued after the saturation pulse sequence is applied, those dark lines can e seen to move, thereby

allowing the tracking of the underlying tissue motion), segmenting the 3-D organ in the images of the sequence for locating the 3D object wall (see fig. 4, col. 9, lines 44-61, col. 4, lines 40-60; model can be tessellated so that each volume element 201-203 has its triangular faces 204, 205 at the LV's inner and outer walls 206, 207, respectively), defining regions of interest on the segmented 3D organ wall (see fig. 6, col. 9, lines 61-67, col. 10, lines 1-5, forces from each boundary data point P, 220, to the corresponding model wall (inner or outer) can be computed by approximating each boundary triangular element with a plane 223), and processing the image data to determine the amplitude of displacement of each of said regions of interest as a function of time (see fig. 9a-c, col. 12, lines 45-62; typical motion of an LV model observed at two subsequent time instances, T and T+1, model frames 300, 301, respectively, which shows that the motion at the apex of the LV is relatively small, relatively uniform longitudinal contraction from apex to base can be captured);

constructing a first 2D simplified representation of the 3D segmented organ wall by projection of the 3D segmented organ wall along an axis, comprising the projections of the regions of interest in said 2D simplified representation (see fig. 9a-c, col. 12, lines 28-67, col. 13, lines 1-18; long-axis views generally coincide with yz-plane 261, the parameter function a3 can capture the longitudinal contraction motion, global translation in the x and the y directions 275, 274, respectively, of the model 2262 frame can be negligible, fig. 9a, a typical motion of an LV model observed at T and T+1, a relatively uniform longitudinal contraction from apex to base can be captured).

Metaxas does not disclose displaying indications of the amplitudes of displacement of the regions of interest of the 3D segmented organ wall in the respective projections of the regions of

interest, called segments, in said constructed 2D simplified representation, in a color coded manner.

Ryals teaches displaying indications of the amplitudes of displacement of the regions of interest of the 3D segmented organ wall in the respective projections of the regions of interest, called segments, in said constructed 2D simplified representation, in a color coded manner (see figure 15, numeral 1528, col. 48, lines 23-46).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Metaxas to display indications of amplitudes of displacement as suggested by Ryals, in order to provide an effective display system allowing efficient location, display and comparison of image frames of the multitude of image frames (see col. 5, lines 1-11).

Regarding **claim 14**, Metaxas with Ryals combination discloses all elements as mentioned above in claim 11. Metaxas with Ryals combination as applied to claim 11 does not teach displaying values of the amplitudes in a color-coded manner.

Ryals, in the same field of endeavor, teaches display displaying values of the amplitudes (figure 13, numeral 1370) in a color-coded manner (figure 15, numeral 1528).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Metaxas with Ryals combination as applied to claim 11 to display values of amplitudes of displacement in a color-coded manner as suggested by Ryals, in order to provide an effective display system allowing efficient location, display and comparison of image frames of the multitude of image frames (see col. 5, lines 1-11).

Regarding **claim 17**, Metaxas discloses all elements as mentioned above in claim 16. Metaxas further discloses construct a first 2D simplified representation of the 3D segmented

organ wall by projection of the 3D segmented organ wall along an axis, wherein projections of the regions of interest are part of the 2D simplified representation (see fig. 9a-c, col. 12, lines 28-67, col. 13, lines 1-18; long-axis views generally coincide with yz-plane 261, the parameter function a3 can capture the longitudinal contraction motion, global translation in the x and the y directions 275, 274, respectively, of the model 2262 frame can be negligible, fig. 9a, a typical motion of an LV model observed at T and T+1, a relatively uniform longitudinal contraction from apex to base can be captured). Metaxas does not disclose displaying indications of the amplitudes of displacement of the regions of interest of the 3D segmented organ wall in segments within the constructed 2D simplified representation, wherein the indications are color-coded.

Ryals, in the same field of endeavor, teaches displaying indications of the amplitudes of displacement of the regions of interest of the 3D segmented organ wall in segments within the constructed 2D simplified representation, wherein the indications are color-coded (see figure 15, numeral 1528, col. 48, lines 23-46).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Metaxas to display indications of amplitudes of displacement as suggested by Ryals, in order to provide an effective display system allowing efficient location, display and comparison of the multitude of image frames (see col. 5, lines 1-11).

Regarding **claim 18**, Metaxas discloses all the elements as mentioned above in claim 16. Metaxas further discloses indications of the maximal or minimal amplitudes of displacement of each of the regions of interest, over a period of time (fig. 9a-c, col. 12, lines 28-67, col. 13, lines 1-18; long-axis views generally coincide with yz-plane 261, the parameter function a3 can

capture the longitudinal contraction motion, global translation in the x and the y directions 275, 274, respectively, of the model 2262 frame can be negligible, fig. 9a, a typical motion of an LV model observed at T and T+1, a relatively uniform longitudinal contraction from apex to base can be captured). Metaxas does not disclose displaying indications.

Ryals, in the same field of endeavor, teaches displaying indications (see figure 15, numeral 1528, col. 48, lines 23-46).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Metaxas to display indications of amplitudes of displacement as suggested by Ryals, in order to provide an effective display system allowing efficient location, display and comparison of the multitude of image frames (see col. 5, lines 1-11).

Regarding **claim 20**, Metaxas discloses all the elements as mentioned above in claim 16. Metaxas further discloses indications of the instants of time at which the maximum or minimum of amplitudes of displacements occur in the regions of interest, over a period of time, in said 2D simplified phase representation (see figure 9a-9c; col. 12, lines 45-63). Metaxas does not disclose displaying indications.

Ryals, in the same field of endeavor, teaches displaying indications (see figure 15, numeral 1528, col. 48, lines 23-46).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Metaxas to display indications of amplitudes of displacement as suggested by Ryals, in order to provide an effective display system allowing efficient location, display and comparison of the multitude of image frames (see col. 5, lines 1-11).

Regarding **claim 21**, Metaxas discloses all the elements as mentioned above in claim 16. Metaxas does not disclose displaying the 2D simplified amplitude representation and the 2D simplified phase representation in a same image at the same time.

Ryals, in the same field of endeavor, teaches displaying the 2D simplified amplitude representation and the 2D simplified phase representation in a same image at the same time (figure 13; col. 38, lines 27-48).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Metaxas to simultaneously display the amplitude representations as suggested by Ryals, in order to provide an effective display system allowing efficient location, display and comparison of the multitude of image frames (see col. 5, lines 1-11).

Allowable Subject Matter

7. Claims 12, 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 12, 15, none of the references of record alone or in combination suggest or fairly teach displaying indications of the maximal or minimal amplitudes of displacement of each of the regions of interest, over a period of time, this first 2D simplified representation being called 2D simplified amplitude representation; constructing a second 2D simplified representation of the 3D segmented organ wall, similar to the first 2D simplified representation of the 3D segmented organ wall, and with similar projections of the regions of interest, called segments, this second 2D simplified representation being called 2D simplified

phase representation; displaying indications of the instants of time at which the maximum or minimum of amplitudes of displacements occur in the regions of interest, over a period of time, in said 2D simplified phase representation; and displaying the 2D simplified amplitude representation and the 2D simplified phase representation in a same image at the same time; wherein displaying indications of the amplitudes of displacement of the regions of interest, and displaying the indications of the instants of time at which the maximum or minimum of amplitudes of displacements occur in the regions of interest in the respective 2D simplified amplitude representation and the 2D simplified phase representation comprises displaying values of the amplitudes and of the instants in time in a color-coded manner.

(10) Response to Argument

The examiner respectfully disagrees that the rejection should be reversed. Only those actual arguments raised by Appellant's are being treated in the Examiner's Answer. Any further arguments regarding other elements or limitation not specifically argued that the appellant could have made are considered by the examiner as having been conceded by the appellant for the basis of the decision of this appeal. Accordingly, they are not being addressed by the examiner for further consideration by the panel. Each of the remarks and or arguments filed with the appeal brief has been considered. A complete response to those arguments is listed here below:

Regarding claims 11, 12, 14, 15, Appellant asserts that the method claims are tied to a particular machine through the image processing system and therefore meet the requirements for 35 USC 101 Tied-to-Criteria (see pg. 7, third paragraph).

The Examiner respectfully disagrees. It is clearly shown that the image processing system is cited within the preamble and is interpreted as generalizing the field of use for the particular method claim 11. The claim does not consist of any particular machine since a image processing system does not have to be a machine, it could be a module/software program or performed manually. Furthermore, the imaging processing system is not considered a machine that is a particular device. As explained before, the system can be considered software or performed mentally which would not be considered as a particular machine. Therefore, the method claim is does not meet the requirements of 35 USC 101 Tied-to-Criteria since the claim does not consist of a particular machine/device and/or the method can be performed manually.

Regarding claim 1, Appellant asserts that Metaxas fails to disclose defining regions of interest on a 3D object wall (see pg. 8, last paragraph - pg. 9, second paragraph).

The Examiner respectfully disagrees. It is clearly shown in Metaxas in figure 4, col. 9, lines 44-61 and col. 4, lines 40-60 that the data points are calculated throughout the volume of the object which is the LV's (left ventricle) inner and outer walls in order to estimate the shape of the LV. As argued by the Appellant, the Appellant agrees within pg. 9, second paragraph, that the Metaxas defines/identifies the 3D object wall by identifying regions of interest within the 3D object wall. Examiner notes that the claim language is broad and can be interpreted reasonably broad as the examiner has in regards to Metaxas. The limitations, "within the 3D object wall" and "on the 3D object wall", are equivalent in reference to Metaxas, since a wall has at least two surfaces. The claim limitation only calls for defining regions of interest on a 3D object wall, which means that as long as any region of interest is defined within any portion of on the 3D

object wall will meet the limitation of the cited claim. The region of interest can be on the inside of the 3D object wall, on the upper portion, lower portion or outside of the 3D object wall. The claim limitation does not specify where the region of interest lies, and the Appellant is implying that since Metaxas defines within the 3D object wall, it does not teach on a 3D object wall since the region of interest is considered inside the structure/object. The Examiner notes that the claim limitation does not cite that the region of interest needs to be on the outer surface of the 3D object nor does it specify where the region of interest lies on the 3D object. If a region of interest is defined as the mid-portion/inside/within a 3D wall it is still considered on the 3D wall. Therefore, Metaxas' reference meets the claim limitation since defining a region of interest within a 3D object wall also embodies "on the 3D object wall”.

Appellant further argues that Metaxas fails to disclose processing the image data of the 3D object wall to determine an amplitude of displacement of each of the said regions of interest as a function of time (see pg. 9, second paragraph).

The Examiner respectfully disagrees. It is clearly shown within Metaxas in see fig. 9a-c, col. 12, lines 45-62 where typical motion of an LV model observed at two subsequent time instances, T and T+1, model frames 300, 301, respectively, which shows that the motion at the apex of the LV is relatively small, relatively uniform longitudinal contraction from apex to base can be captured. Metaxas discloses that the amplitude of displacement is shown between times T and T+1, regardless of whether the times are arbitrary, the amplitude or maximum magnitude is determined. Furthermore, Metaxas states that the motion of the left ventricle (LV) is shown from the apex to the base at two subsequent time instances, T and T+1, therefore the reference

shows that the amplitude of displacement is shown for the regions of interest as a function of time.

Appellant argues that Metaxas fails to disclose a 2D simplified representation by projecting the 3D object wall along an axis, with the projections of the regions of interest (see pg. 10, first paragraph).

The Examiner respectfully disagrees. It is clearly shown within Metaxas in fig. 9a-c, col. 12, lines 28-67, col. 13, lines 1-18; parameters a1 and a2 can be combined as one parameter to model the LV's radial contraction; long-axis views generally coincide with yz-plane 261, the parameter function a3 can capture the longitudinal contraction motion, global translation in the x and the y directions 275, 274, respectively, of the model 2262 frame can be negligible, fig. 9a, a typical motion of an LV model observed at T and T+1, a relatively uniform longitudinal contraction from apex to base can be captured. Metaxas shows within fig. 9a-c, a simplified version (2D version) of the volumetric or 3D model as seen within figures 4, 5, 8a and their corresponding sections within the specification. Furthermore, Metaxas also specifies within col. 12, lines 1-25, that the three-dimensional shape and wall motion estimation can be shown in respect to the x-y plane in order to capture radial contraction motion by calculating parameters a1 and a2 in order to model the LV's radial contraction in various 2D views. It is clear that Metaxas fully meets the limitations of the claims by disclosing constructing a 2D simplified representation by projecting the 3D object wall along an axis, with the projections of the regions of interest, are also stated as creating a 2D representation of the 3D object wall.

Appellant argues that Ryals et al fails to make up the deficiencies of Metaxas (see pg. 10, second paragraph).

The Examiner respectfully disagrees. Examiner notes that Metaxas is utilized to teach the limitations as cited above and the Appellant is directed to the previous arguments.

Appellant argues that the rejection of claim 11 should be reversed due to the same reasons as stated within claim 1 (see pg. 10, third paragraph).

The Examiner respectfully disagrees. Since, Appellant is referring back to the reasons and argument stated in claim 1, Examiner also refers back to the reasons and arguments as mentioned above in claim 1.

Regarding claims 2-10, 14, Appellant argues that the rejection of the cited claims should be reversed due to the dependency from claim 1 and 11, respectively (see pg. 10, fourth paragraph).

The Examiner respectfully disagrees. Examiner notes that the arguments and remarks for claims 1 and 11 are not persuasive and therefore the rejections have not been reversed for the independent claims and likewise to any subsequent dependent claims.

Regarding claims 17-18, 20-21, Appellant argues that the rejection of the cited claims should be reversed due to the dependency from claim 16, respectively (see pg. 10, last paragraph).

The Examiner respectfully disagrees. Examiner notes that the arguments and remarks for claim 16 are not persuasive and therefore the rejection has not been reversed for the independent claim and likewise to any subsequent dependent claims.

Appellant argues that the rejection of claims 16 and 19 should be reversed due to the same reasons as stated within claim 1 and through the dependency from claim 1 (see pg. 11, first paragraph).

The Examiner respectfully disagrees. Since, Appellant is referring back to the reasons and argument stated in claim 1, Examiner also refers back to the reasons and arguments as mentioned above in claim 1. Furthermore, Examiner notes that the arguments and remarks for claim 16 are not persuasive and therefore the rejection has not been reversed for the independent claim and likewise to any subsequent dependent claim(s).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Edward Park/

Examiner, Art Unit 2624

Conferees:

Samir Ahmed

/Samir A. Ahmed/

Supervisory Patent Examiner, Art Unit 2624

Matt Bella

/Matthew C Bella/

Supervisory Patent Examiner, Art Unit 2624